

Analyzing Student-Advisor Interactions During First-Year Undergraduate Mathematics Advising

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This poster reports on findings from a larger research project focused on a mathematics department's advising practices for incoming undergraduate students. This analysis explores how talk and gesture in student-advisor interactions play a role in how students are given particular mathematics course recommendations and explores the mediating role of gender in the interaction.

Recent trends show men and women are earning bachelor's degrees at near equal rates, however women only account for about one-third of undergraduates earning bachelor's degrees in a STEM discipline. Furthermore, women account for an even smaller fraction when compared to men among those earning bachelor's degrees in math-intensive STEM majors (Canaan & Mouganie, 2023; Jiang, 2021; Louten, 2022; Suárez & Beatty, 2022). While examinations of the gender gap in math-intensive STEM majors is not a novel research area, existing research has largely focused on in-classroom, faculty-level, and curriculum-specific interventions while minimizing the role of one-on-one interactions and outside-of-classroom contexts. One such overlooked site for intervention is undergraduate, pre-course-enrollment mathematics advising.

The mathematics advising explored in this study takes place at a large, public, midwestern university. Incoming undergraduate students opt in to meeting one-on-one with a member of the mathematics department (i.e., tenured faculty, postdoctoral researchers, graduate students) while they consider which math class to take. The sessions are short, lasting just 5-10 minutes on average and conclude with the student and advisor reaching a non-binding math course recommendation. Advisors and students have had no prior interactions. Advisors receive minimal to no training prior to engaging in the work of advising (Gholson et al., 2021; Margolis et al., 2023).

In a very short amount of time, students must provide information about their math background, academic desires, and future goals, and advisors must absorb this information and leverage their understanding of course details and major requirements to reach a course recommendation. Initial analyses of the advising sessions uncovered that students with similar mathematics backgrounds are sometimes given quite distinct math course recommendations that differ widely in terms of their ambitiousness (e.g., Statistics versus Honors Calculus I). Why is this happening? The analysis reported on in this poster examines paired sessions where students with similar mathematics backgrounds are given distinct course recommendations and is guided by the following questions:

1. How is student mathematical competence co-constructed through student-advisor interaction in undergraduate mathematics advising sessions?
2. How, if at all, does gender mediate the co-construction of a student's mathematical competence and the final course recommendation a student receives?

Student and advisor talk are examined in tandem with an embodied analysis based on video recordings of the advising sessions and corresponding transcripts to answer these questions. The layering of discourse analysis and embodied analysis provides a fuller picture of the advising interaction compared to either method in isolation and offers multiple avenues for exploring how gender might mediate interaction.

References

- Canaan, S., & Mouganie, P. (2023). The Impact of Advisor Gender on Female Students' STEM Enrollment and Persistence. *Journal of Human Resources*, 58(2), 593–632. <https://doi.org/10.3368/jhr.58.4.0320-10796R2>
- Gholson, M., Margolis, C., Crosley, E. (2021). *Exploring the Context and Interactional Dynamics of Undergraduate Students' First Mathematics Advising Experiences* [Brief Research Report]. Annual conference for the American Educational Research Association, San Francisco, CA.
- Jiang, X. (2021). Women in STEM: Ability, preference, and value. *Labour Economics*, 70, 1–32. <https://doi.org/10.1016/j.labeco.2021.101991>
- Louten, J. (2022). Fostering Persistence in Science, Technology, Engineering, and Mathematics (STEM): Creating an Equitable Environment That Addresses the Needs of Undergraduate Students. *Journal of College Student Retention: Research, Theory & Practice*, 0(0), 1–20. <https://doi.org/10.1177/15210251211073574>
- Margolis, C., Crosley, E., & Gholson, M. (2023). *Co-Construction of Course-Taking Narratives in Undergraduate Mathematics Advising* [Preliminary Report]. Conference on Research in Undergraduate Mathematics Education, Omaha, NE, United States. <https://drive.google.com/file/d/178jhbtXkvU0dU0upRTuzl29sexsUJr8G/view>
- Suárez, E., & Beatty, C. C. (2022). Advising in science education: Critiquing where we have been, moving toward an equitable and holistic advising approach. *Science Education*, 106(5), 1299–1317. <https://doi.org/10.1002/sce.21745>